

A Fundamental Study on Productivity and Social Behaviors of Forestry Work Groups : A case study of two different groups

Shioya, Tsutomu

Nakashima, Yoshinori

Sasaki, Kaoru

<https://doi.org/10.15017/15000>

出版情報 : 九州大学農学部演習林報告. 37, pp.255-268, 1964-02-29. 九州大学農学部附属演習林
バージョン :
権利関係 :

A Fundamental Study on Productivity and Social Behaviors of Forestry Work Groups

— A case study of two different groups —

Tsutomu SHIOYA, Yoshinori NAKASHIMA
and Kaoru SASAKI

Problem

In their efforts toward the modernization of forest industries in our country the management has committed to mechanization and the so-called "scientific management" of the Taylorian type. Time and motion studies were carried out repeatedly and carefully at a great expense in order to set work standards for the mechanized work situations. But applications of those standards to the actual fields revealed that the standards thus set did not work well. Work groups similarly composed, similarly equipped and working on a similar field often produced so differently that the standards could hardly maintain their significance.

As in other industries, so in forestry, though very late, social determinants of productivity came to draw people's attention. When the management encounter workers' resistance and disturbances in their attempts to introduce changes (for instance, a new machine and hence a new arrangement of works) they are forced to recognize the significance of informal small groups of which the workers are members. Workers live in a set of social settings as well as in a physical environment. They get out of those settings satisfaction of their needs, especially of those needs for warm and close social relationships. It is clear today that the successful management of the forestry requires a good understanding of human or social aspects (e.g. the workers' social attitudes, the social climate and cohesiveness of the group, the type of leadership, and the informal organization of member interaction, etc.) as well as technical aspects of the work situations.

The purpose of the present study is, through an exploratory investigation, to find out how the productivity of a work group co-varies with its social behaviors, thus providing a basis for an improved organization of forestry work groups. With many practical limitations our approach could only be of a case-study type.

Method

The research problem was first presented to Kumamoto R.F.O. (The Regional Forestry Office) at the beginning of May, 1962. Listening to our explanation the R.F.O. admitted the importance of the research project and promised that they provide us with possible conveniences. On the basis of the information available through the office two skidding work groups were selected for the present study, which belonged to one of the D.F.O's (District Forestry Office) under the jurisdiction of the R.F.O., and whose productivity generally viewed had been widely different from each other.

Since cooperation not only of the personnel but also of the labor union in the

D.F.O. was essential to the study, our research team group-interviewed those people and discussed about the significance of the study and finally got them interested and cooperative. It should be mentioned here with deep gratitude that they actually continued to be cooperative and helpful all through the investigation, in opening communication channels and in providing transportation, boarding and other facilities for us.

The field work of the research team consisted of four parts: the preliminary survey, the questionnaire survey, the individual interview and the observation.

Background

Either of the two skidding work groups we selected for the present study was consisted of eight workers (a foreman, an assistant foreman, and six men), forming a work unit to carry the timbers which had been cut down by felling work groups from the spot where they were felled down to a particular place (*Doba*) where they were to be piled up for shipment. The two groups, although belonging to the same D.F.O., were from different communities and were supervised by the different B.O's (the Business Office).

The work group under the supervision of P Business Office will be referred to as *p group* and the one supervised by Q Business Office as *q group*.

(1) The A.K. Community and the p group

The p group live with their families in a community formed around the P B.O. on the upper of the river A.K., 350 m above the sea level and 32 km along A.K. lumber road from the town of Y. where the D.F.O. is located. The community has been settled down since 1942 and is inhabited at present with about 300 people in 76 households. The Table 1 shows the recent composition of the community inhabitants.

Table 1. The Inhabitants of Community A. K. (1960)

	D.F.O. Personnels and Workers		School Teachers	Others	Total
	P. Business Office	A.K. Charge Office			
Number of Households	49	8	4	15	76
Number of Members in Families	204	31	11	75	321

Life materials are for the most part supplied through Co-op (*Kyosaikumiai*) of the D.F.O. Since the forest roads for the car transportation was opened (1954), merchants from the town of Y. sometimes bring their goods for sale into this community.

The situation concerning electric power has been somewhat queer. Despite the river A.K. has two generating stations run by the prefectural office the people in the A.K. community could not use the power. So the D.F.O. built a small independent station to self-supply the electricity for the community. But the small generating facilities are not stable enough for the variations of weather, nor can meet the ever-increasing demand. It is, therefore, very natural that the local labor union has taken up this issue and has tried to improve the situation by approaching the prefecture-running stations. The result of the adhesive negotiations had proved promising by the time when our research started,

No bus service was yet available between the community and outside. Some regular transportations for very limited number of travellers were provided by the D.F.O.

There was a branch school near the P B.O. for children in the community. The school houses were consisted of two ridges (390 m² in all); one for junior high school pupils and the other for primary school children. The play-ground of 1.0 ha is not large enough for 30 junior high school pupils and 50 primary school children.

(2) The Q B.O., the N community and the q group

The Q B.O. which supervise the q group is located in the valley of the river A.M., 180 m above the sea level and 18 km to the town of Y. This B.O. was newly established at the beginning of April, 1962, recruiting its personnel and workers from another B.O. (the R business office). Unlike the P B.O. in the A.K. community the Q B.O. could not be a core around which a community was formed, but a single office with some facilities to accommodate bachelor personnel.

The q group with their families live in a community (the N community) 4 km to the town of Y. This community was also built anew when the Q B.O. was established. Electricity and water supply are laid for each house and almost every family enjoys some electrification of their lives (washing machines, televisions or radio sets, etc.).

The workers commute by a Diesel train every day about 14 km between their homes and work-fields which are in the vicinity of the Q B.O.

The composition of the N community population in 1962 is shown in Table 2.

Table 2. The Inhabitants of Community N. (1962)

	D.F.O. Personnel and workers		Others	Total
	K.N. Business Office	A. Nursery		
Number of Households	25	12	40	77
Number of Members in Families	98	47	196	341

Children and pupils go to schools in the town of Y.. Housewives go shopping down to the town of Y., and workers themselves also go to the town on Saturday night or Sunday for their recreation, seeing movies or playing *pachinko*.

Group Population

Table 3 shows the age, the length of the job experience, the pay rate and the family composition of each member of the two groups. The pay rate (*Kakuzuke Chingin*) is used when the group gross production is divided into the members' individual shares. A member's share (S_i) is computed in the following way.

$$S_i = P \times \frac{D_i \cdot R_i}{\sum D \cdot R} \quad \text{where} \quad \begin{array}{l} P : \text{group's gross production} \\ D : \text{Number of workday} \\ R : \text{Pay rate} \end{array}$$

From these informations presented in the table we may conclude that the two groups are pretty similar to each other in their member composition.

Now, turning to the individual capacity of the group members several indices were computed on the basis of physical measurements and the length of the job

Table 3. The Age, the Length of the Job Experience, the Pay Rate and the Family Composition of Each Worker

Member	Age (years)	Length of Job Experience (years)	Pay Rate (¥/Day)	Family Composition		
				Spouse	Children	Others
The p group						
M.T. Foreman	45	22	816	1	4	0
I. H. Assistant foreman	34	15	783	1	4	0
S. T. Man 1	27	11	752	1	2	0
I. Y. 2	40	22	777	1	4	0
M.S. 3	56	15	708	1	0	0
T. T. 4	29	14	683	1	1	0
K.T. 5	30	16	720	1	2	0
T.K. 6	25	10	656	0	0	0
The q group						
T. A. Foreman	50	32	821	1	2	1
M.T. Assistant foreman	34	18	776	1	2	0
F.N. Man 1	44	24	738	1	5	0
T. Ki 2	43	28	749	1	3	1
Y. S. 3	36	19	771	1	2	0
T. Ka. 4	27	9	731	1	2	0
S. K. 5	28	10	681	1	1	1
R. T. 6	21	3	635	1	0	2

experience for each worker and are shown in Table 4. For the sake of comparison between the two groups the method of a linear discriminate function Z was employed. The result is shown in Table 5. This again shows that there are no significant differences between the two groups as far as the individual capacity of the members is concerned.

Table 4. The Individual Capacity of Each Worker

Member	Weight	Height	Girth of Chest	G. of Upper Arm	(1)	(2)	(3)
The p group							
Foreman	63 kg	164 cm	96 cm	32.2 cm	23.42	7.24	3.28
Assistant	58	166	87	28.5	21.05	5.22	2.57
Man 1	57	170	86	28.8	19.68	4.88	2.12
2	62	168	87	30.0	17.50	5.73	3.48
3	56	162	85	27.3	20.78	4.95	2.00
4	57	168	84	27.6	20.19	4.68	2.60
5	57	160	93	31.6	22.27	6.54	2.92
6	55	164	86	29.3	20.45	5.15	2.00

The q group

Foreman	67	166	97	30.8	24.31	7.26	4.53
Assistant	56	163	85	26.7	21.08	4.73	3.09
Man 1	58	162	87	26.9	22.10	5.11	3.62
2	63	167	88	29.8	22.59	5.92	4.27
3	65	162	103	32.0	24.78	8.16	3.17
4	59	168	90	29.7	21.67	5.79	1.73
5	59	165	88	28.5	20.90	5.24	1.89
6	56	161	91	30.0	21.60	5.90	0.65

Notes (1) Kaup's Index as a indicator of development of body frame

$$=(\text{Weight})/(\text{Height})^2$$

(2) An index as growth of subcutaneous fat and muscles

$$=(\text{Weight}/\text{Height}) \times (\text{girth of Chest}/\text{Height}) \times (\text{girth of upper arm})$$

(3) An index as experienced skillful expert $= (\text{Total experienced years})/\sqrt{(\text{age})}$

Table 5. The Comparison of Z's between the Two Groups
(By means of a linear discriminate function Z)

Group	Member								Group's Total
	Foreman	Assistant F.	Man 1	Man 2	Man 3	Man 4	Man 5	Man 6	
The p group	18.15	17.26	16.12	12.37	17.16	16.80	17.50	16.68	132.04
The q group	19.57	17.67	18.43	18.34	18.81	17.50	17.06	17.22	136.26

Productivity

It was found impossible to obtain a direct measure of productivity of the groups from the records kept by the B.O's. Among the difficulties were the facts that the gross production of two or more groups, not a single group, determined the workers' wages, that the working situations the two groups were in were not similar enough to be compared with each other in a simple manner, and that the newly established Q B.O. had not yet recorded long enough to estimate the q-group's productivity.

The only indication that we could find in the B.O.-kept documents concerning productivity was extremely indirect one: the premeditated production for the year. Let us look up Table 6. This is, again, an assignment, not to a single work group, but to two or more groups that belonged to a B.O. The outputs to be achieved by the P and Q B.O's, however, are markedly different even if the number of workers

Table 6. The Premeditated Production for the Year (1962.4—1963.3)

B.O.	Output to be achieved(1)	Number of Skidding workers(2)	Output per worker (1)/(2)
P	9800 m ³	24 (3 groups)	408.33 m ³
Q	5000 m ³	17 (2 groups)	294.11 m ³

are considered (see the output per worker). The reader should notice that these assignments were premeditated at the D.F.O. on the basis of the achievement in past* and remember that the p and q group were chosen for their difference in productivity.

Apart from the documents kept by the B.O's, an attempt was made to obtain

some more direct measure of productivity: snap-reading. The method provided the amount of time that each worker was working (actual work) or resting (allowance) on the 95% level of confidence. And these amounts of time, then, convertible on the basis of the types of work into the energy consumed (Cal) were finally transformed into the average R.M.R. for each worker. Table 7 and Figure 1 show the results.

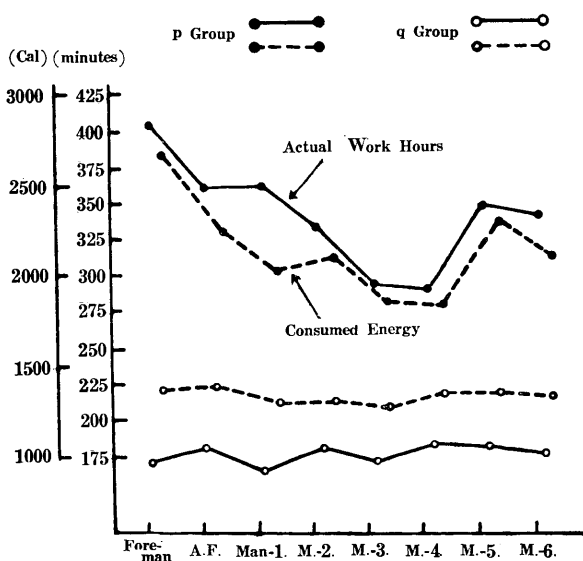
Table 7. Rate of Actual Work and Allowance Hours, Volume of Work, Consumed Energy and Average R.M.R. (By means of snap-reading)

The p group		Time (minutes)	Volume of Work	Consumed Energy (cal)	Average R.M.R.	%
Foreman	Actual Work	388.2-420.0	2164.22-2341.50	2,603.21-2,771.63	5.57	80.9-87.5
	Allowance	60.1- 91.8	62.32- 95.20			
Assistant	Actual Work	343.3-380.7	1702.77-1888.27	2,164.83-2,341.06	4.96	71.5-79.3
	Allowance	99.3-136.7	97.91- 134.79			
No. 1	Actual Work	346.8-383.2	1483.61-1639.33	1,956.66-1,967.14	4.28	72.2-79.8
	Allowance	96.8-133.2	97.96- 134.80			
No. 2	Actual Work	317.3-356.7	1569.68-1764.59	2,038.40-2,222.56	4.95	66.1-74.3
	Allowance	123.3-162.7	127.62- 168.39			
No. 3	Actual Work	279.3-320.6	1369.97-1572.54	1,848.67-2,041.11	4.95	58.2-66.8
	Allowance	159.4-200.7	174.27- 217.16			
No. 4	Actual Work	275.3-316.6	1299.69-1494.67	1,781.91-1,967.14	4.72	57.4-66.0
	Allowance	163.4-204.7	174.67- 218.82			
No. 5	Actual Work	330.8-369.2	1775.73-1981.87	2,234.14-2,429.98	5.34	68.9-76.9
	Allowance	110.8-149.2	111.80- 150.54			
No. 6	Actual Work	327.8-366.2	1568.85-1752.63	2,037.61-2,212.20	4.79	68.3-76.3
	Allowance	113.8-155.2	119.15- 162.49			
The q group						
Foreman	Actual Work	155.5-196.8	792.27-1002.70	1,299.86-1,499.77	5.10	32.4-41.0
	Allowance	283.2-324.5	178.42- 204.44			
Assistant	Actual Work	163.2-204.5	786.62- 985.69	1,389.49-1,483.61	4.82	34.0-42.6
	Allowance	275.0-316.3	234.85- 270.12			
No. 1	Actual Work	147.8-189.1	691.56- 884.80	1,205.13-1,387.76	4.68	30.8-39.4
	Allowance	286.6-327.8	246.76- 282.24			
No. 2	Actual Work	161.3-202.6	740.85- 930.54	1,251.01-1,431.21	4.59	33.6-42.2
	Allowance	277.4-318.7	240.23- 275.99			
No. 3	Actual Work	148.3-189.6	707.09- 904.01	1,218.94-1,406.01	4.77	30.9-39.5
	Allowance	290.4-331.7	252.94- 288.91			
No. 4	Actual Work	166.1-208.3	780.50- 978.80	1,288.68-1,477.06	4.70	34.6-43.4
	Allowance	272.2-314.4	234.36- 270.70			
No. 5	Actual Work	163.7-205.9	786.25- 988.94	1,285.59-1,486.69	4.80	34.1-42.9
	Allowance	274.2-316.2	240.11- 277.08			
No. 6	Actual Work	160.3-201.6	756.30- 951.15	1,265.69-1,450.79	4.72	33.4-42.0
	Allowance	278.4-319.7	241.09- 276.86			

* Although the Q B.O. and hence the q group were established newly the personnel and workers were all recruited from the R B.O. Informations about their achievement, though not in a precise tabulation, were available.

We assume that in such a muscular labor as timber skidding productivity goes in proportion to the amount of working time or the consumed energy. To the extent to which this assumption is correct the table 7 delineates the difference in productivity between the p and q group. It can be concluded that the p group was more productive than the q group.

Fig. 1 Actual Work Hours and Consumed Energy



Social Characteristics

The questionnaire data and individual interviews revealed following differences between the two groups.

(1) Values

The members of the p group maintain higher pride in their job than members of the q group and feel that their families also maintain the pride (Tables 8a and 8b). The q-group members are more skin to the salariedman (in contrast with the artisan) in their way of thinking than the p-group members are (Tables 9 and 10). The members of the p group except for the foreman show somewhat higher authoritarianism on a simplified F-scale; the foreman of the p group is the least authoritarian while the foreman of the q group is among the most authoritarian (Table 11).

Table 8a. Pride in One's Own Job

"How significant do you think your job (National Forestry Worker) is in general?"

	The p group	The q group
Very significant	1	0
Fairly significant	* 3	* 5
so so	2	1
Rather insignificant	0	1
Definitely insignificant	0	0
no answer	1	0

* The foreman's answer.

Table 8b. Percieved Pride of the Family in One's Own Job
 "How significant do you guess your family think your job is in general?"

	The p group	The q group
Very significant	1	1
Fairly significant	* 4	3
so so	1	2
Rather insignificant	1	1
Definitely insignificant	0	0
Don't know	0	* 0

Table 9. Salaried-manship vs. Artisanhip (I)

"Do you think that a national forestry worker should take every chance to improve his own skill even at the cost of some personal comfort, or that he should consider, just as salaried employees in urban cities do, the welfare of himself and of his family rather than getting skilled?"

	The p group	The q group
Getting skilled is all important	0	0
Skill rather than welfare	0	0
No special priority	0	0
Welfare rather than skill	* 3	* 2
Welfare is all important	4	5
No answer	0	0

Table 10. Salaried-manship vs. Artisanhip (II)

"Which form of wages do you like best?"

	The p group	The q group
Piece wage	1	0
Daily wage	0	0
Monthly salary	* 6	* 7
No preference	0	0
No answer	0	0

Table 11. Authoritarianism

	The p group	The q group
Mean Score	3.61	3.12
Men's Foreman's	3.00	4.34
S.D. of men's M.S.	0.52	0.36

(2) Attitudes toward the Management and the Rewarding Systems

The p-group members seem to be relatively B.O.- oriented while the q-group members union-oriented (Tables 12 and 13). The p-group members show a little more satisfaction with the present system of the pension and the retiring allowance than

the q-group members (Table 14). Little or no differences in the satisfaction with the personnel arrangement, the pay rate and the piece rate (applied to a particular field)

Table 12. The Object to which the Workers feel Loyalty
"To whom or what do you feel loyalty in your work situation?"

	The p group	The q group
Head of D.F.O.		
D.F.O. as a Whole		
Head Official of the Business Section in D.F.O.		
Chief of B.O.	*	
B.O. as a Whole	2	
Foreman	1	2
Assistant Foreman		
Fellow workers in the Group	2	3
Union Stewards		1
Union as a Whole		
None		* 1
No answer	2	0

Table 13. Consultants in Daily Life Situation
"With whom do you consult first on your personal troubles?"

	The p group	The q group
Foreman		
Assistant Foreman	* 2	*
In-Group Worker	1	1
Out-group Worker		
Chief of B.O.		1
Sub-chief of B.O.	2	
Union Steward		4
Superior in D.F.O.		
Others		
No answer	2	1

Table 14. Satisfaction with the Present System of the Pension and the Retiring Allowance
"Are you satisfied with the present system of the pension and the retiring allowance?"

	The p group	The q group
Satisfied very much	0	0
Fairly satisfied	1	0
So so	1	1
Rather dissatisfied	2	* 2
Strongly dissatisfied	* 2	4
No answer	1	0

are found between the two groups. The foreman of the p group, however, expressed very high satisfaction with first item and some dissatisfaction with the last item while the other foreman showed relatively lower satisfaction and higher satisfaction respectively (Tables 15 and 16).

Table 15. Satisfaction with the Personnel Arrangement Set by the D.F.O. or the B.O.
"Are you satisfied with the personnel arrangement set by the D.F.O. or the B.O.?"

	The p group	The q group
Satisfied very much	* 0	0
Fairly satisfied	1	2
So so	4	* 3
Rather dissatisfied	1	1
Strongly dissatisfied	0	1
No answer	1	0

Table 16. Satisfaction with the Piece Rate
"Are you satisfied with the piece rate which is applied to the field you are working in?"

	The p group	The q group
Satisfied very much	1	1
Fairly Satisfied	1	* 1
So so	2	2
Rather dissatisfied	* 3	2
Strongly dissatisfied	0	1
No answer	0	0

(3) Leadership

Relatively, the p group is productivity-minded while the other human-relations centered (Table 17). Judging from the members requests the differentiation of leader function seems higher in the p group than in the q group (Table 18). The frequency with which the members make proposals to their leader is greater in the p group than the q group (Table 19) and the p group members feel that their foreman pays more attention to these proposals than the q group members feel their leader does (Table 20). The ratings of the leader's fairness by the members is somewhat lower for the p-group foreman than for the q-group leader (Table 21), but the former is wished by the members to remain foreman of the group longer than the latter is hoped to remain

Table 17. Leadership Type

	The p group	The q group
Definitely Productivity-minded	2	1
Rather Productivity-minded	* 3	1
No predominance	2	1
Rather Human-Relations-centered	0	* 3
Definitely H-R-centered	0	1

(Data from Individual Interview)

(Table 22). Some additional data from observation indicate that the p-group leader is a man of few words but a great expert of the job. Communication between the leader and his men depends heavily on the assistant foreman's intervention.

Table 18. Differentiation of Leader Function

"Do you think that the foreman of your group should do more supervisory work rather than the same work as men do or vice versa?"

	The p group	The q group
More supervisory work	1	* 2
Leave the matter as it is	0	5
More of the same work	* 5	0
No answer	1	0

Table 19. Frequency with which Members make Proposals to Their Foreman

"How often do you make proposal to your foreman concerning the work?"

	The p group	The q group
Very often	3	0
Often	* 2	* 6
Not often	1	1
Never	0	0
No answer	1	0

Table 20. Attention Paid by the Foreman to the Members' Proposals

"How much attention does your foreman pay to those proposals made by the members?"

	The p group	The q group
Much attention	2	1
Moderate attention	* 3	* 5
Insufficient attention	0	1
Little attention	0	0
No answer	2	0

Table 21. Leader's Fairness

"Do you feel that your foreman is fair in assigning the works to the members?"

	The p group	The q group
Very fair	0	1
Pretty fair	* 0	3
Not very fair	5	3
Unfair	1	0
No answer	1	* 0

Table 22. Satisfaction with the Foreman
 "How long from now on do you want your foreman to remain in his present position?"

	The p group	The q group
As long as possible	2	* 1
Four or Five years from now on	* 3	5
Until some day next year	0	1
No answer	2	0

(4) Group Cohesiveness

The group cohesiveness is usually defined as a resultant force on the group members to remain in the group, and three sources of the group attraction have been frequently referred to: the activities the group is engaged in, the members of the group and the prestige the group members can enjoy. Table 23 may be relevant to the first source, Tables 24 and 25 to the second and Table 26 might give some indirect

Table 23. Work Preference
 "Which kind of work do you like to engage in?"

	The p group	The q group
Skidding	* 6	* 1
Felling and Cutting	1	3
Driving a truck	0	2
Others	0	0
No answer	0	1

Table 24. Consultant in Daily Life Situation
 "With whom do you consult first on your personal troubles?"

	The p group	The q group
In-group	4	2
Out-group	2	5
No answer	2	1

(Re-tabulation from Table 13 without distinction between foremen and men)

Table 25. Satisfaction with the Group
 "Are you satisfied with your group?"

	The p group	The q group
Satisfied very much	2	1
Fairly satisfied	* 3	* 1
So so	0	5
Rather dissatisfied	0	0
Strongly dissatisfied	1	0
No answer	1	0

evidence in respect to the third source. These data are constant with one another, indicating that the p group is more cohesive than the q group is.

Table 26. Pride in the Group's Productivity
 "How do you evaluate your group's productivity relative to other groups
 which belong to the B. O.?"

	The p group	The q group
The Best	3	0
Better than the average	4	2
Just average	0	* 2
Worse than the average	0	2
Irrelevant or no answer	*	1

(Data from Individual Interview)

Conclusion

Two skidding work groups whose productivity has been markedly different from each other were chosen for the present study. In the hope that some basis for an improved organization of work group in forestry might be found an exploratory investigation of case study type was made with some emphasis on social psychological aspects of the groups.

The result showed that higher productivity coincided with higher pride in their own job, with higher authoritarianism of the group members, but with lower authoritarianism of the leader, with management-orientation rather than union-orientation, with relatively greater satisfaction with the present system of the pension and the retiring allowance but with less satisfaction of the leader with wages. The group with higher productivity was found to have been led by a very skillful, productivity-minded foreman and a supportive assistant foreman, and to be more cohesive.

Great caution, however, should be taken before any conclusion may be drawn out of these data. For the first place, because of the methodological limitations our findings can never refer to the causal relations between variables, but only correlations. Secondly, the correlation or coincidence between productivity and leadership type may be conditioned by the values and culture of the society. In fact, all the members of the research team are unanimous in that mere transfer of the p-group leader to the q-group will not increase the group's production. Another caution should be taken for the classification of leadership type. A simple dichotomy of productivity-minded vs. human-relations-centered has proved to be unsuccessful by the recent studies in laboratories and fields. Instead, these two characteristics should be considered as independent dimensions along which actual leadership is determined dually. A recent experiment on leadership showed that the output level of the group was basically determined by the leader's productivity mindedness or pressure, and the acceptability by the members of the pressure toward higher production was increased with the leader's human-relations mindedness (or maintenance function). This applies to our data. When we spoke of productivity-mindedness of the p-group foreman, we did not mean that he lacked consideration for his men, but in fact, the personal interview and the observation gave impression that he was just as warm as the leader of the other group.

The present study revealed the coincidence of the group productivity with some social characteristics of the group and suggests that interaction of leadership and values of the community affects the work group productivity.

Field experiments with greater control of conditions on larger samples will be necessary before complete understanding of the forestry work groups and policies to improve the situation may be reached.

Acknowledgement

It is with deep gratitude that we acknowledge those helps we received at the various stages of the study. Mr. Nobuo ANDO, research assistant, Mr. Seiichi SATO and Mr. Sanshiro SHIRAKASHI, both graduate students, the Faculty of Education, Kyushu University, collaborated with us in some part of designing and in the field works. Mr. Taro HOSO, the former Chief of Kumamoto R.F.O., Mr. Kenji OSAWA, the former head of Operation Section and Mr. Shinpei IWASHITA, official of Labor Branch, Kumamoto R.F.O. kindly accepted our research project and provided us with several facilities. And finally our thanks from the bottom of the heart should go to those people in the D.F.O. and the B.O.'s including those two groups, who were so cooperative throughout the survey.